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ABSTRACT

The purpose of this study was to determine the disruptive effect of unknown words on reading and to examine this effect in relationship to grammatical position and modification type. Forty second grade children from two different lower middle class, semirural schools were randomly assigned to the standardization group or the experimental group. Two versions of the same story with the same number of words were used to gather data. Version 1, the unmodified version (UV), was retyped exactly as it appeared in a basal reader. Version 2, the modified version (MV), contained largely the same text, but with approximately 5 percent of the words changed. Words in the MV were altered according to grammatical positions and types. Reading errors were recorded and tallied by numerical position. The results indicated that the experimental group made a greater percentage of errors in crucial positions than the standardization group; errors surrounding unknown words were greater for the experimental group's reading of MV versus UV than those in the equivalent positions surrounding known words; and there was no significant difference in the number of errors surrounding words modified by type. (WR)

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THE DISRUPTIVE EFFECT OF UNKNOWN WORDS ON THE ORAL READING OF SECOND GRADE STUDENTS

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Purpose

The major purpose of this study is to isolate and determine the disruptive effects of unknown words in oral reading. Additionally, such factors as the grammatical position of an unknown word and the similarity of an unknown word to other known words were examined in relation to their disruptive effect.

Observation of oral reading reveals that many children tend to produce errors in clusters. It seems possible that one unknown word may produce an environment in which errors occur on surrounding known words. In effect, one error may produce a triggering of other errors that would not have occured had the original unknown word not been present. The ramifications of this suggested phenomenon may result in artificially depressed scores on such oral reading measures as informal reading inventories, standardized oral reading tests, and portions of diagnostic reading instruments.

Much of the work in the area of language processing has been done using written materials as a stimulus. It seems plausible then that since much of the psycholinguistic groundwork has been laid with research in the area of reading, that some principles of language processing probably apply to the processing of written language through reading. This leads to the question: Does the grammatical position (defined here as noun, verb, or modifier) of an unknown word have an influence on the degree of the disruptive effect? In other words, are some grammatical positions more critical than others in relation to where an unknown word is encountered? An answer to this question could have significant implications for authors of childrens reading materials.

Children often use one of a number of possible word attack skills when confronted with an unknown word. Thus, given a range of possible strategies, some words may seem to be more 'decodeable' than others. Does a word they may seem more similar to known words produce less of a disruptive effect than a word which is more atypical? For instance, is a hard yet real word in English less disruptive than a 'word' which is not phonologically possible in English (e.g. initial vs. ngehl); or is a phonologically possible nonsense root with a meaningful marker more easily decoded than a phonologically possible word without a meaning marker (e.g. trockly vs. clidge)?

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ABSTRACT

THE DISRUPTIVE EFFECT OF UNKNOWN WORDS
ON THE ORAL READING OF SECOND GRADE STUDENTS

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Purpose: To determine the disruptive effect of unknown words on reading, and to examine this effect in relationship to grammatical position and modification type.

Procedures: An unmodified version (UV) and a modified version (MV) of a story were presented. Words in the MV were altered according to grammatical positions and types. Forty students were assigned to the Standardization Group (SG), the Experimental Group 1 (EG_1), or the Experimental Group 2 (EG_2). Reading errors were recorded and tallied by numerical position. Chi Square and Analysis of Variance were the analytical techniques used.

Findings: Hypothesis 1, concerning number of errors throughout the passage for the SG's and EG's readings was rejected. A greater percentage of errors was made in crucial positions by the EG than the SG.

Hypothesis 2, concerning the EG's reading of MV versus UV, was rejected. Errors surrounding unknown words were greater than those in the equivalent positions surrounding known words.

Hypotheses 3 and 4, concerning modifications by grammatical position and by type were accepted, though the findings were in the direction hypothesized.

The final motivation for this study has a research orientation. The implications of using modified 'words' and measuring their disruptive effect needs to be investigated in order to validate the technique. There are many possible uses of such a research technique if it can be determined that one unknown word does in fact trigger errors on surrounding known words.

Literature Review

Traditionally, examination of oral reading skills has centered on the sum of a student's errors as a product for quantitative inspection. The familiar Gray Oral Reading Test (1963), the Gilmore Oral Reading Test (1951), the oral reading sections of such diagnostic instruments as Durrell Analysis of Reading Difficulty (1955), and the Gates-McKillop Reading Diagnostic Test (1962), and the traditional informal reading inventories all derive their basic word accuracy scores by summing insertions, substitutions, omissions, etc. Unfortunately, quantitative analysis lends little insight to the ongoing psychological and linguistic processes of the readers.

Robinson (1972) has called for a new era in test construction, or one that will measure oral reading as a qualitative function of processes rather than a quantitative sum of errors. The Reading Miscue Inventory (Goodman and Burke, 1972) may be the first instrument to emerge from the psycholinguistic research into oral reading behaviors. With a trend developing towards the examination of oral reading as a qualitative process, definitive knowledge about the nature of the process is required. If the questions surrounding oral reading analysis are to undergo a change in nature from "How many"? to "Why"?, extensive input from reading specialists, linguists, and learning psychologists is mandatory.

Researchers in the areas of language development and language pathology have frequently made use of nonsense items to isolate specific linguistic variables for analysis. Arnold, Bower, and Bobrow (1972) used nonsense disyllables in sematically compatible and incompatible sentence frameworks to support the hypothesis that comprehensibility affects association formation. Marwit, Marwit, and Boswell (1971) examined the ability of black and white children to derive present, plural, possessive, and time extension forms of nonsense syllables. Krossner (1971) used CVC pattern nonsense syllables in analysis of associative value in class membership statements. The use of nonsense items in examining syntax is listed as one of the six most used methods by Slobin (1967).

Researchers in Reading have generally utilized nonsense items in a different manner. Combining letters to form familiar spelling patterns without meaning has been done to examine pure phonic word attack skills (Gates-McKillop Reading Diagnostic Test, 1962). While this utilization of nonsense items is justified, their are numerous untouched applications for the use of nonsense words to examine oral reading abilities and present oral reading instruments.

The use of Cloze procedure indicates that their are linguistic constraints operating both within and between sentences in oral and written language that enable a reader to supply a missing word by use of sourrounding contextual clues (MacGinitie, 1961, Ramanskus, 1972, Torrey, 1969). However, their is no definitive information indicating what effect a missing word or an unknown word in written language will have on the known words in the surrounding context. Obviously, if an unknown word has a detrimental effect on the recognition of surrounding known words, re-examination of traditional quantitative oral reading analysis is necessary.

Procedures

Forty second grade children were drawn from two classrooms in two different lower middle class, semi-rural schools. The total population of these two classrooms was forty-six; however, six students who were essentially nonreaders were dropped from the sample. The remaining forty children were randomly assigned to the standardization group (SG) or the experimental group (EG). The EG and SG were both comprised of twenty students.

Two versions of the story "Plant Doctor" (Early et. al., 1970) were reproduced with permission from Harcourt, Brace and World. "Plant Doctor" was selected as stimulus material because of its middle second grade difficulty level as ascertained by the Fry Readability Graph (1968) and the Spache readability formula (1953), and because of the appeal it appeared to hold for rural or semi-rural children. Version one, the unmodified version (UV), was retyped with a primary typewriter exactly as it appeared in the basal reader. Version two, the modified version (MV), contained largely the same text, but with approximately five percent of the words changed. (On the average, about one word in twenty was altered.) These modifications became the unknown "words". Beginning with the forth sentence, and in every other sentence from that point on, selected words in the UV were replaced with specifically designed unknown "words". This version of the story became the MV.

Each version had the same number of words. Every word was assigned a numerical position, except the modified words in the modified version of the story and those words in the unmodified version that were later replaced in the modified version. The word modifications were made on two bases: 1) type of modification, and 2) grammatical position of the modification. The replaced words were modified by type in four ways. The passage contained six of each of the following types of modified words:

1. Real words of a difficulty level considered more than second grade (e.g. companions)

2. Nonsense words that are phonologically possible in English but which do not occur, and are without meaning markers. (e.g. proy)

3. Nonsense roots that are phonologically possible in English but which do not occur and have a meaning marker (e.g. spacks)

4. Nonsense words which are not phonologically possible in English (e.g. ndalq).

These modified words were then assigned to one of three grammatical positions in the MV: nouns, verbs, or modifiers. There were eight words holding each of these positions in the MV.

The story was individually administered to every subject (S) in a quiet testing area. The story was read orally and was tape recorded for later verification of scoring procedures. A total of three judges scored each protocol. Discrepancies were resolved by consensus.

The SG read only the UV of the story. The data for this group were used to establish a criterion for oral reading performance on the story. Therefore, the SG was tested on only one occasion.

The EG was divided into two groups of 10. EG_1 read the original version of the text and then after a one week delay, read the modified version. EG_2 read the two texts in inverted order. This procedure was done to control for the effect of learning.

Errors in oral reading were classified into the following form categories:

1. Omissions: Only whole word omissions were scored and assigned positions.

2. Additions: Whole word additions were scored and assigned the numerical position of the immediately preceding word.

3. Substitutions: Any pronunciation error was scored as a whole word substitution and assigned the numerical position of the actual word in the text.

4. Repetitions: Repetitions were considered an error regardless of the number of words repeated. Repetitions involving spontanous self corrections were not considered errors. A repetition was assigned the numerical position of the first word repeated.

Errors such as hesitations or punctuations were not considered in this study.

Errors from each protocol were entered onto data cards by numerical position for analysis purposes. A composite tally of errors by word position for each group (SG, EG_1 and EG_2) was calculated. The composite print-outs for each group served as the data for analysis.

Chi Square and analysis of variances were used to test the hypotheses. The first hypothesis tested was: There is no significant difference between the number of errors surrounding a specific unknown word and the number of errors in those positions throughout the story which are not surrounding unknown words. For this purpose the EG's reading of the modified version of the story was compared to the SG's reading of the unmodified version. A two by two Chi Square analysis was used.

The second hypothesis was: Within the EG there is no significant difference between the number of errors made in the positions surrounding the unknown words in the modified version of the story and the equivalent positions in the unmodified version of the story. A two by eight Chi Square analysis was used.

The third hypothesis was: There is no significant difference in the number of errors surrounding unknown nouns, verbs, or modifiers in the reading of the modified version by the EG. A one way analysis of variance was used.

The fourth hypothesis was: There is no significant difference in the number of errors surrounding difficult words, phonologically possible nonsense words, nonsense roots with meaningful markers and phonologically impossible words. A one way analysis of variance was used to test the hypothesis.

Findings

Hypothesis one, the crucial hypothesis of the study because of the dependancy of the remaining hypotheses, concerns the locations of errors throughout the passage. As can be seen in Table 1 the errors made by the EG on surrounding positions accounted for over 50% (260/501) of the total errors, while for the SG the errors in the surrounding positions accounted for less than 33% (267/806) of the total errors. Hypothesis 1, concerning surrounding versus non-surrounding positions, was rejected at the .01 alpha level. A significantly greater proportion of errors were made by the experimental group than the SG in the positions surrounding unknown words.

Hypothesis two concerns the reading by the experimental group of both versions of the story. As can be seen in Table 2 more errors were made on the modified text than the unmodified text. Not only was the total number of errors greater, but the errors for each surrounding position were greater or the modified text. The greatest number of errors were in the ± 1 positions. Hypothesis two, concerning the number of errors in word positions surrounding unknown words in comparison to equivalent positions in the unmodified text, was rejected at the .01 alpha level. A significantly greater number of errors were made in the modified text.

Hypothesis three, concerning the number of errors surrounding unknown words in various grammatical positions was accepted. The observed F value (.23) was non significant at the .01 alpha level. There was no significant difference in the number of errors surrounding unknown words in various grammatical positions, nouns, verbs, and modifiers.

Hypothesis four, concerning the number of errors surrounding unknown words modified by type, was accepted. The observed F value (.6556) was non significant at the .01 alpha level. There was no significant difference in the number of errors surrounding words modified by type.

Conclusions

The data from this study support the notion that a higher incidence of oral reading errors is associated with close proximity to unknown words. This would suggest the need for qualitative analysis of oral reading errors, particularly if they are made in clusters. The child who errs on "easy" words such as and, said, etc. may not have produced this error because he did not know the word, but because of its close proximity to an unknown word. He may have had his attention diverted from the "easy" word to the more difficult one. Unknown words can be disruptive in terms of oral reading. Those assessing oral reading behavior should be aware of this phenomenon.

This conclusion is further strengthened by the rejection of hypothesis two. The same children, reading the same words on two different occasions, erred more frequently when the words were in close proximity to unknown words in the modified version; they made fewer errors on the identical words when the unknown word was not present.

The disruptive affect in oral reading is most apparent in the word immediately preceeding and the word immediately following the unknown word. More than twice as many errors occured in the ± 1 position surrounding an unknown word than on the same word position without the presence of the unknown word. While the disruptive effect was observed in all eight surrounding positions, it was most evident in the immediately adjacent positions.

While hypotheses three and four of this study were accepted, the data indicated trends that might be borne out in further study with larger samples. These researchers hypothesized that unknown words in verb positions would be more disruptive than unknown words in modifier positions and that they, in turn, would be more disruptive than unknown words in noun positions. Though not statistically significant, the rankings obtained were as hypothesized. Similarly, it was hypothesized that phonologically impossible modified words would create the most disruptive effect and that nonsense roots with meaningful markers would be least disruptive. Once again the rankings were as hypothesized, although not statistically significant.

The technique used in the study to assess disruptive influence in oral reading appears to be promising. The rejection of hypotheses one and two suggest a degree of validity in the research technique. The trends observed in hypotheses three and four suggest potential for further investigation.

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TABLE 1

DISTRIBUTION OF ERRORS BETWEEN SURROUNDING AND NON-SURROUNDING POSITIONS

OBTAINED

	Surrounding Positions	Not Surrounding Positions	
errors	260	241	501
non-errors	3580	7059	10639
	3840	7300	N = 11140

Data from EG's reading of modified version

EXPECTED

	Surrounding Positions	Not Surrounding Positions	
errors	267	539	806
non-errors	3573	6761	10334
	3840	7300	11140

Data from SG's reading

$X^2 = 178.08892$
sig. $> .01$

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TABLE 2

ERRORS SURROUNDING MODIFIED WORDS AND UNMODIFIED WORDS

OBTAINED
Surrounding Word Positions

	-4	-3	-2	-1	+1	+2	+3	+4
errors	31	20	27	57	45	12	23	45
non-errors	449	460	453	423	435	468	457	435

N = 3840

Data from EG's reading of modified text

EXPECTED
Surrounding Word Positions

-4	-3	-2	-1	+1	+2	+3	+4
17	18	20	21	24	9	22	43
463	462	460	459	456	478	458	437

3840

Data from EG's reading of unmodified text

$x^2 = 98.55368$
sig. .01

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TABLE 3

RELATIONSHIP OF GRAMMATICAL POSITION AND DISRUPTIVE EFFECT

Source	SS	df	MS	F
Between	18.0334	2	9.0167	F = .23
Within	823.2500	21	39.20238	
Total	841.2834	23		

*F .95 (2,21) = 3.47
**F .99 (2,21) = 5.78

TABLE 4

RELATIONSHIP OF TYPE OF MODIFICATION AND DISRUPTIVE EFFECT

Source	SS	df	MS	F
Between	42.8429	3	14.2809	F = .65560
Within	609.8750	28	21.78125	
Total	652.7179	31		

*F .95(3,28) = 2.95
**F .99 (3,28) = 4.57